

Genomics and YOU: Exploring questions at the intersection of science and society

**OLLI Fall 2022
Tuesdays 3.30pm – 5pm (OLLI classroom or on Zoom)**

COURSE OVERVIEW

Genomic biology combines information about genes, their functions, and their interactions with the environment to develop a predictive understanding of biological systems and behavior relevant to solving medical, energy and environmental challenges. The last 20 years has seen an unprecedented development of new technologies with consequences for science and society. This course will introduce learners to genes and genomes, explore technological advances in genomic research in a wide range of disciplines, and consider how these advances are impacting society. Additionally, the course will provide perspective on why diversity matters in our study systems, in our educational spaces, and in society. Faculty will be drawn from the nationally recognized [Carl R. Woese Institute for Genomic Biology \(IGB\)](#) and the University of Illinois Urbana-Champaign research and teaching community, one of the premier institutes of its kind in the country.

CONTACT INFORMATION

Organizer: Dr. Eva K Fischer

Email: efischer@illinois.edu

About me: I am an Assistant Professor in the Department of Evolution, Ecology, and Behavior and an affiliate of the Gene Networks in Neural and Developmental Plasticity theme at the Carl R Woese Institute for Genomic Biology. Research in my lab asks how brains and behavior can be both strikingly flexible and remarkably robust, and how these phenomena simultaneously give rise to widespread similarities and prodigious diversity in animal behavior. We use integrative approaches to address these questions across hierarchical levels of biological organization (from genes, to networks, to neural circuits, to physiology, to behavior) and timescales (from immediate, to developmental, to evolutionary). I believe the fundamental principles governing brains and behavior are most apparent when we leverage natural diversity, and my lab therefore combines lab and field studies to understand variation and adaptation in ecologically relevant behaviors. My current research specifically takes advantage of the remarkable interspecific diversity in behavior, morphology, and life histories in charismatic frog species. Beyond research, my team is passionate about teaching, mentoring, and community engagement. I helped build the “Froggers School Program” that brings hands-on learning to K-12 classrooms and my lab contributes to a range of annual community engagement and educational programs hosted through the Institute for Genomic Biology. Learn more about our research and meet the lab at ekfischerlab.com

COURSE SCHEDULE

- Sept. 13th** **Eva Fischer**, Department of Evolution, Ecology, and Behavior, UIUC.
IGB Theme: Gene Networks in Neural & Developmental Plasticity (GNDP)
Eva Fischer studies how the brain makes behavior and how behavior evolves. In this lecture, she will discuss how she uses genomic tools to investigate whether evolution has used shared or distinct neural, molecular, and physiological building blocks to similar parental behaviors across diverse animals.
- Sept. 20th** **Pamela Martinez**, Department of Microbiology, UIUC.
IGB theme: Infection Genomics for One Health (IGOH)
Pamela Martinez studies the ecology and evolution of infectious diseases. Using longitudinal data collected from the UIUC SHIELD project and COVID-19 outcomes associated with socioeconomic inequalities, Dr. Martinez will describe the different ways in which we can understand why and how SARS-CoV-2 infectious outcomes might differ among individuals and populations.
- Sept. 27th** **Katy Heath**, Department of Plant Biology, UIUC.
IGB theme: Infection Genomics for One Health (IGOH)
Katy Heath explores complex coevolutionary dynamics in plant-microbe systems using a diversity of plant, fungal, and bacterial systems. This lecture will discuss mobile genes in microbes and how these mobile genes bring traits to their plant and animal hosts through symbiosis.
- Oct. 4th** **Steven Burgess**, Department of Plant Biology, UIUC.
IGB theme: Genomic Ecology of Global Change
Steven Burgess utilizes synthetic biology tools to simplify, miniaturize and automate engineering of photosynthetic organisms, with the ultimate goal of creating more sustainable ecosystems. Advances in DNA sequencing and synthesis have transformed the ability to not only read, but write the genetic code. This lecture will provide an introduction to the topic of synthetic biology and discuss how it can be used to introduce new-to-nature functionality for biotechnological purposes.
- Oct. 11th** **Gene Robinson**, Department of Integrative Biology, UIUC.
Director of IGB.
Gene Robinson uses genomics and the honeybee to study the mechanisms and evolution of social behavior. This lecture will discuss how 20 years ago Dr. Robinson's laboratory used research on the complex social life of honey bees, coupled with the then-new science of genomics, to reframe the perennial nature-nurture debate. The lecture will also cover recent advances on this topic that further illuminate the complex relationship between genes and behavior, along with current societal implications.
- Oct. 18th** **Ripan Mahli**, Department of Anthropology, UIUC.
IGB Theme: Genomic Security and Privacy (GSP)
Ripan Mahli use molecular techniques together with community-based approaches to address questions at the intersection of biology, paleontology, and society. The paleogenomics field is rapidly growing due to recent advances in genomic technologies and analyses. This lecture will discuss the Mahli lab's research program on paleogenomics in

partnership with Indigenous communities in North America to address questions about the impact of European colonization in North America.

Oct. 25th

Kathryn Clancy, Department of Anthropology, UIUC.

IGB theme: Environmental Impact on Reproductive Health (EIRH)

Kathryn Clancy critically engages with questions around the influence of environmental stressors on the life history and reproductive physiology of women and gender minorities. In this lecture, Dr. Clancy will discuss her work exploring the connections between COVID-19 vaccinations and women's health.

Nov. 1st

Charles Roseman, Department of Evolution, Ecology and Behavior & Department of Anthropology, UIUC.

Charles Roseman conducts interdisciplinary research to understand the genetic basis of complex traits and their evolution, as well as the societal and historical contexts and consequences of studies seeking to understand the biological basis of human traits. Specific lecture topic TBD.